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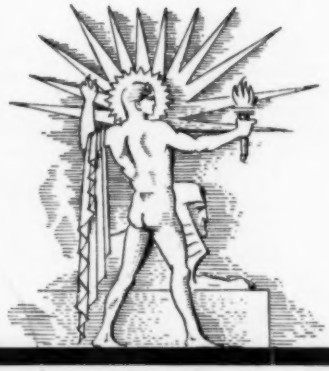
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



May 18, 1940

Reflection Pattern

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A SCIENCE SERVICE PUBLICATION

Do You Know?

First discovered in *azaleas* in Charleston, S. C., a disease known as azalea flower spot is spreading in Florida.

Pale colors will be fashionable in British textiles, it is predicted, as a means of making dye supplies go farther.

Since Oklahoma City pioneered in use of *parking meters* in 1935, about 155 American cities have installed them.

The greatest depth to which a *submarine* has been known to descend without being crushed is a little over 400 feet.

A new safety *lantern* for miners has a twin-bulb socket enabling a burned-out bulb to be replaced by a "flick of the thumb."

Food economists say that the United States produces enough food to provide a fairly satisfactory *diet* for every person in the country.

The *Santee Canal,* which carried cargoes of indigo, rice, and cotton in eighteenth century South Carolina, is being restored for service.

A medium-sized *automobile* carries 108 pounds of gasoline, 10 pounds of oil, 29 pounds of water, five pounds of grease, two pounds of dilute acid.

Insects are not likely to overwhelm mankind, says a Harvard biologist, who finds evidence for the view that the insects have passed their peak of development and are already on the road to decadence.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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PSYCHOLOGY

Do "opposites" attract each other? p. 317.

How does a democratic atmosphere in the home affect the children? p. 317.

What distinguished those not scared by Martian broadcast? p. 313.

ZOOLOGY

How long has the rabbit been on this earth? p. 309.

Papaya fruits vary in weight from a few ounces to 25 pounds.

More than a century ago, in New England the *birth rate* started falling because children ceased to have economic significance, says one sociologist.

Efforts to use by-products of Philippine Islands industries include making *cellulose* from sugar cane fiber, and coir fiber from coconut husks.

Most Mediterranean countries are almost bare of *timber,* says a professor of forestry, because Greeks and other former great nations failed to conserve it.

Sheep need to have good shelter available after shearing, lest they catch serious cold.

Differences in temperature noted above oil *salt domes* may offer a new guide in oil prospecting.

Several thousand tons of China's *tung oil* are reported to be carried each month over back country trails toward Indo-China.

Canned *juice* blends tried out by research scientists include red grape and orange, apricot and apple, prune and grapefruit.

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PHYSICS

What About Atomic Power? Facts and Fancy Separated

Uranium Can Be Split to Release Energy But It Would Take 75,000 Years to Make Pound of It

IS ATOMIC power at hand? Here is the way *not* to write the story of this possibility but the flood of reports which have swept the country telling of the isolation of a rare isotope of uranium with mass 235 and the possible implications of this discovery for releasing atomic power, make it highly desirable that some one sit down, take off the gloves, separate fact from fancy and give a fair picture of what is happening. Here are the facts. Fantasy may come later.

1. Over a year ago, when it was first discovered that uranium atoms could be split by bombardment with neutrons, neutral atomic particles, and made to release a large measure of the atomic energy, Prof. Niels Bohr, Danish Nobelist, and Dr. John A. Wheeler of Princeton forecast that atoms of uranium 235 would probably be split by very weakly energetic, "slow" neutrons. Only high energy neutrons, they predicted, would be successful in splitting the common form of uranium with mass 238. (*See SNL,* Mar. 11, 1939)

2. Occasion for the recent spectacular retelling of the story of uranium fission, which has been reported again and again since late in January, 1939, was the confirmation of the Bohr prediction on uranium 235 by Dr. A. O. Nier of the University of Minnesota and Drs. E. T. Booth, J. R. Dunning and A. V. Grosse of Columbia University.

Isolated by Nier

3. Dr. Nier made possible this confirmation by isolating, in an instrument known as a mass spectrometer, the tiny sample of uranium 235 which was only a few millionths of a gram of material. Other scientists, including Drs. K. H. Kingdon and H. C. Pollock of the laboratories of the General Electric Company, have been effecting similar concentrations of uranium 235 and uranium 238, its heavy common isotope. Prof. J. W. Beams, using a gold-plated centrifuge at the University of Virginia, has been working on the problem but is having the material he has isolated checked in a mass spectrometer to determine its atomic weight. He has just told Science Service he has no specific report to make until this mass spectrometer test is concluded.

4. The isolation of the uranium 235 isotope is extremely slow, tedious and costly in time and effort. Figures discussed by Drs. Kingdon and Pollock reveal that even for the much more abundant uranium isotope of mass 238 it takes three hours of operation to produce one and eight-tenths of a microgram, where a microgram is a millionth of a gram and a gram is less than one four-hundredth of a pound.

Very Slow Work

Simple computation shows that at this rate it will take scientists some 70,000 days (over 191 years) to make a single gram of concentrated uranium 238 and over 400 times as long — over 75,000 years—to make a pound of this material. The rare isotope of uranium of mass 235, occurring in only one part in 139 in comparison with uranium 238, would take still longer for its production.

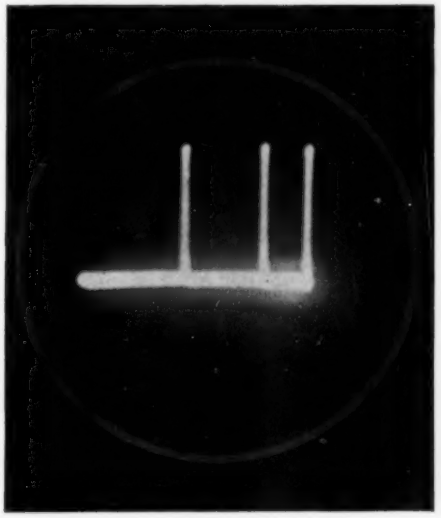
5. It has been indicated that a chain reaction occurs in uranium fission with neutrons. This fact was announced from Paris by the co-Nobelist scientist Prof. J. Joliot and his colleague Dr. H. von Halban. This important fact has not yet been confirmed, conclusively, in America. (*See SNL,* Feb. 10, 1940)

So much for the facts about uranium's fission which, unembellished, are seemingly prosaic. Much better reading —and the cause of the widespread use of the recent story—is the speculation about the future of the possible release of atomic energy from uranium.

Taking off from fact into fancy one can cite the following:

1. The separation methods of isolating uranium 235 are bound to improve so that while it may take over 75,000 years to concentrate a pound of uranium 235 today it may be done far quicker in the future. Perhaps the scientists' wish for a five-pound chunk of the stuff can be realized within our times.

The war in the north has stopped con-



URANIUM FISSION

When the energy of a splitting uranium atom is detected and put into an oscillograph, electrical pulses can be seen which closely resemble those shown here.

struction of a thermal diffusion apparatus which promised, by theory, to speed the concentration of the rare uranium 235 isotope by a factor of 11,000 times. The thermal diffusion method offered the possibility of obtaining a gram of uranium 235 within three years whereas best American production reported has been a gram in 33,000 years. The thermal diffusion tubes described by Prof. Wilhelm Krasny-Ergen of the University of Stockholm (*Nature*) are easy and cheap to make. A whole series run in tandem or separately could greatly increase the yield of rare uranium 235 still further.

2. It may not be necessary to have pure uranium 235 (U-235) to find practical uses. True, the U-235 works best with the weak neutrons but uranium 238, much more common, splits with fast, high-energy neutron bombardment. It can be recalled that the discovery of uranium fission was obtained with uranium oxide — a commonplace chemical compound widely spread throughout the earth.

3. The energy liberated from uranium by fission is enormous and weight for weight it is at least 5,000,000 times as effective as coal.

Chain Reaction Possible

4. If the chain reaction of having one uranium atom split and liberate the neutrons which will split another one near by and so on, can be controlled, then a compact power source for military purposes could be achieved despite whatever the cost might be. Things which are

uneconomical in a peacetime sense become practical for military services if they can perform tasks not possible, or carried out as easily, in any other way. No price can be put on such developments that might save the life of a nation which owned the discovery, any more than one can put a price on a surgical operation which saves a man's life.

5. Is Germany pressing the utilization of the discovery of uranium fission? The answer is probably yes, for it has been pointed out since the first announcement of the sensational find that Germany was the home of the original discovery, and that German scientists have had a six months' and more start on their research. (*See SNL,* Feb. 11, 1939)

This drive is going on in all nations and does not require the special large cyclotron atom smashers which dominate the American scientific scene.

The whole virtue of uranium fission for any possible practical applications is that it does not require huge heavy cyclotrons to set off the fissions and release the energy. A little bit of radium mixed in a flask with beryllium and embedded in a block of paraffin is the entire "source" that is required. This radium-beryllium mixture is a source of neutrons and with these to bombard uranium the uranium splitting and its own chain reaction do the rest.

Those five points are the fancy which may or may not come true within our times. There are others, like the uranium bomb, which go beyond fancy into the fantastic.

Probably the sanest forecast of the future is that uranium atomic power will be so valuable when and if it comes, that it will be used only for the most special purposes for which it is characteristically adapted and which it can do better than anything else.

Uranium fission will probably have its greatest benefits as a ready-at-hand, compact source of neutrons which are highly sought-after in medicine and biological experiments and in nuclear physics. Every university may yet have its own neutron source. (*See SNL,* Mar. 2, 1940.)

Science News Letter, May 18, 1940

PHYSICS

Will Atomic Power Release Come As Gigantic Explosion?

WHEN the power within the uranium atom is released, as scientists hope that it will be by atom-smashing, will it come as a gigantic explosion?

This possibility has some scientists worried. They do not believe the whole earth will explode, but they do fear that the experimenter and his laboratory might disappear in the disaster of a successful experiment.

A particular variety of the heaviest chemical element, uranium of mass 235, has been shown to split and release enormous energy when attacked by a relatively slow and unenergetic atomic particle, called a neutron. In this atomic smash, more neutrons are produced. These are capable of producing more uranium splitting if they score hits on the right kind of uranium atomic centers. And so the explosions might continue, just as they do when powder or TNT explodes, one atom setting off another.

There is plenty of uranium in the earth's crust.

Even neutron bombardment of a fairly rich piece of uranium ore does not cause an explosion or release of appreciable atomic power because the uranium atoms are so diluted with other atoms around them. The attacking neutrons will spend themselves futilely colliding with unresponsive common atoms.

In hope of getting away from this limitation, attempts are being made to concentrate uranium 235 in very pure form, which is a long and tedious job.

If this can be done, another barrier to too dangerous explosions may exist. Strangely the explosiveness is caused by relatively slow neutrons of low energy. If the neutrons are too powerful, with energies of about 10,000,000 electron-volts, the fission is a dud. A mere capture with release of trivial energy takes place. If an explosion of pure uranium 235 does begin, it may produce enough of the high energy neutrons to bring about these dud reactions and damp out the incipient cataclysm.

In working with uranium, the scientists are like soldiers who know too little about the artillery they are hoping to fire, afraid that it may go off prematurely and fearful that it may not fire at all when they try to pull the trigger.

Science News Letter, May 18, 1940

GENERAL SCIENCE

Excerpts From Address By President Roosevelt

The Eighth American Scientific Congress was formally opened on the evening of Friday, May 10 with an address by President Franklin D. Roosevelt. The assembled delegates from twenty-one Republics of the three Americas were the audience.

". . . This hemisphere is now almost the only part of the earth in which such a gathering can take place. Elsewhere war or politics has compelled teachers and scholars to leave their great calling and to become the agents of destruction. . . .

"In our search and in our teaching we are a part of a great adventure—an exciting adventure—which gives to us a larger satisfaction even than did the adventure of settling the Americas give to our Founding Fathers. We feel that we are building human progress by conquering disease and poverty and discomfort, and by improving science and culture, removing one by one the cruelty, the crudity and the barbarism of less civilized eras.

"In contrast, in other parts of the world, teachers and scholars are not permitted to search for truth lest the truth when made known might not suit the designs of their masters. Too often they are not allowed to teach the truth as they see it, for truth might make men free. . . .

"You who are scientists may be told that you are responsible because of the processes of invention for the annihilation of time and space, but I assure you that it is not the scientists of the world who are responsible, because the objectives which you have had have looked toward closer and more peaceful relations between all nations through the spirit of cooperation and the interchange of knowledge.

"What has come about has been caused solely by those who would use, and are using, your inventions of peace in a wholly different cause—those who seek to dominate hundreds of millions of people in vast continental areas—those who, if successful in that aim will, we must now admit, enlarge their wild dream to encompass every human being and every mile of the earth's surface.

Science News Letter, May 18, 1940

Chinese in the fourteenth century recorded their observations of sunspots.

The "life expectancy" of *automobiles*—like that of humans—is lengthening and cars are now used on the average more than nine years.

NUTRITION

Greenland's Plight Spurs Red Cross to Send Scout

Six Weeks' Survey Will Be Made to Determine Food Needs of Eskimos Cut Off from Denmark

WHILE the American Red Cross dispatches an investigator to Greenland via the Coast Guard cutter Comanche to find out what supplies are needed to keep alive Greenlanders cut off by fortunes of war from Denmark, in Washington a nutritionist is working the island's food problem on paper.

It is all part of preparedness, in case the United States takes part in sending a food ship to the isolated northern island.

The survey in Greenland will be made by Michael R. Reddy, Red Cross assistant national director of disaster relief.

Checking long lists of supplies that Denmark has customarily sent to its distant colony, Miss Melva Bakkie, nutritionist of the American Red Cross, is translating Danish foods into equivalents which America might ship. It is complicated arithmetic. It involves converting tons and gallons of meats and dairy supplies into a list of our available foods which would presumably provide enough vitamins, minerals, fats, proteins, and carbohydrates to ward off serious malnutrition.

In the lists of Danish exports to Greenland last year, Miss Bakkie finds such items as 900 tons of corn meal, 8.7 tons of barley, 6.7 tons of wheat, 88 tons of rice grits, 210 tons of potatoes, 414 tons of sugar, 24 tons of pork, 19 tons of frozen beef, 29 tons of coffee, 4.5 tons of chocolate, 8 tons of cabbage, 22 tons of butter in casks and cans, 88,000 eggs, 106 tons of confections.

Most urgently dependent on outside food supplies are the 400 Danes who live in Greenland. They are said to eat little Eskimo food, which is so different from the diet to which continental Europeans are accustomed.

Greenland's 16,000 Eskimos, while less dependent on outside food sources so long as hunting is good, fall back more heavily on trading posts for food, when gales or other catastrophes prevent them from fending for themselves. If a post's stores are low, then the natives may be in for a bad winter. Denmark has held a monopoly of Greenland trade, sending supplies only during the months from March to October, when ships can reach Greenland without icebreaker convoy.

"We do not know exactly, what proportion of food sent to Greenland has been vitally needed to keep Danes and Eskimos going," explained Miss Bakkie. This will be learned by Mr. Reddy.

"The trade list of foods has included such obvious luxury items as 1,000 pounds of canned sardines, anchovies, and herring, 2.3 tons of liver paste, 500 pounds of bouillon—single items in a year's supplies of many tons of more basic food, but evidence that the Danes, at least, in Greenland have imported some of their food for variety and attractiveness."

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NOT A GOBLIN

This strange figure at the left shows how the wearer of Dr. Lehmberg's new respirator looked after coal dust was blown directly into his face for a test. With respirator removed, the pattern on his face indicates the protection afforded mouth and nose.

ZOOLOGY

Rabbits Most Ancient Of Living Known Mammals

RABBITS, together with the opossums, are the most ancient of the living known mammals on our continent, dating back to Eocene times some 30,000,000 to 40,000,000 years ago. This is one of the incidental findings in the great exploration of ancient life on this America which has centered around Dr. William B. Scott, professor emeritus of geology at Princeton, who in our time has greatly extended science's knowledge of the animals of the past, both those whose descendants are now living and those whose lines have become extinct.

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PUBLIC HEALTH

New Respirator Protects Against Dust Hazards

NEW defense against dust and pollen is a light and efficient filtering device over nose and mouth combined with goggles to protect the eyes designed by W. H. Lehmberg, an American Optical Company scientist. It promises to do its part in fighting silicosis and hay fever. Approved by the U. S. Bureau of Mines, the new mask weighs but an ounce and a half. It excludes particles of dust as small as one micron, 1/25,000 of an inch, and has a new self-equalizing double headband which holds the mask securely but comfortably regardless of the position of the head.

Science News Letter, May 18, 1940

India, with its 239,000,000 Hindus, has a minority of 80,000,000 Moslems.

CORONAGRAPH

Ready, for an attack not on an airplane but on the problem of physical conditions on the sun. This first coronagraph in the Western Hemisphere is to be erected in Colorado this summer.

PHYSIOLOGY

Reveal Scandinavian Blood In Veins of Scotch

SCOTTISH and northern English soldiers fighting in Norway have blood of Scandinavian ancestors in their veins.

Taking advantage of Britain's wartime preparedness in which large numbers of people have had their blood typed for emergency transfusions, Dr. R. A. Fisher of the Galton Laboratory at Rothamsted and G. L. Taylor of the Galton Laboratory Serum Unit at Cambridge report that they have been able for the first time to study the distribution of blood types throughout Great Britain's population.

Scottish blood is similar to that of Iceland's people, descended from Scandinavian Vikings, the scientists report. (*Nature*, April 13.)

Modern Norwegians and Swedes are, in fact, far less Viking in their blood type, a fact which is attributed to the blending of central or eastern Europeans into Scandinavia's population since Viking days.

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ASTRONOMY

World's Highest Astronomical Observatory To Be Established

At Fremont Pass, Climax, Colorado, Astronomers Will Have Their Clearest Look at the Sky

THE WORLD'S highest astronomical observatory will be established in the Rocky Mountains in Colorado this summer by Harvard University. It will be located at Fremont Pass, Climax, Colorado, at an altitude of 11,318 feet. The object of the high elevation is to obtain the clearest possible sky, one free from dust and other air particles which can completely upset these delicate observations.

Major purpose of the station will be to make regular observations of the sun's corona or pearly halo, usually visible only at the time of a total eclipse when the moon shuts off the sun's brilliant light. The studies will be made with a coronagraph, a new instrument which creates artificial solar eclipses for astronomers.

This is the first coronagraph in the Western Hemisphere and only the third in the entire world. It will not immediately entirely replace astronomers' familiar junkets to far-off lands to study natural eclipses, for there are some studies for which the instrument is not adapted, but it should provide a mass of badly needed material, especially day-to-day records.

Dr. Donald H. Menzel of the Harvard Observatory, who is in charge of setting up the new station, expects the day-to-day studies of the solar corona to be important not only theoretically but also practically, for it should enable the forecasting of such violent and widespread electrical storms as that which crippled the world's communication services on Easter Sunday this year.

Observations of such solar activities as sunspots, solar prominences and the corona, and of the inter-relationships of these phenomena, should also lead to a better knowledge of physical conditions on the sun and the influence of these on earth, Dr. Menzel said.

The Harvard coronagraph employs the same principle as that invented by the French astronomer, Dr. Bernard Lyot, and used by him for observations from a station in the Pyrenees. Fundamentally, it is a special type of telescope in which an appropriate screen masks out the bright solar image, thus creating an artificial eclipse of the sun.

All telescopic lenses must, of course, be free of the slightest flaws, but exceptional care has been taken with the ones for the coronagraph, for the tiniest imperfection would be sufficient to scatter light and obscure the faint corona. This gaseous envelope of the sun is only half as bright as the moon, a millionth as bright as the sun, and is, of course, completely obscured under normal circumstances by the sun's own brilliance.

A special feature of the Harvard coronagraph will be the treatment of the lenses with the "invisible-glass" technique developed at the Massachusetts Institute of Technology by Dr. C. Hawley Cartwright, to reduce reflections and scattered light. (See page 314)

The station will also be equipped with a powerful spectrograph for the study of the spectrum of the corona. Motion pictures will be used to study solar prominences and also the corona in an effort to learn how this peculiar structure changes from day-to-day.

The station will be built on the property of the Climax Molybdenum Company, through whose cooperation it has been made possible. Harvard already has stations at Oak Ridge, Mass., and Bloemfontein, South Africa.

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RADIO

Billion Dollar Sales Forecast for Television

FOR research on television to date $25,000,000 has been spent, according to a survey made by Dr. Orestes H. Caldwell, editor of *Radio Today*. Of this, RCA-NBC spent $10,000,000. For research during 1940, the estimate is $4,000,000, of which half is by RCA-NBC. When and if television reaches development corresponding to the present radio development Dr. Caldwell foresees $1,000,000,000 annual sales volume, 3,500,000 sets sold annually and 500,000 new jobs created.

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PHARMACEUTICS

"Ersatz" Cod Liver Oil For Youngsters Next Winter

Conditions in Europe Have Abruptly Cut Off Source Of 70% of Oil Used to Keep Growing Children Well

AMERICAN youngsters will probably have to take an "Ersatz" cod liver oil next winter as a result of the war in Norway, Robert William Rodman, of *Druggist's Circular,* predicted at the meeting of the American Pharmaceutical Association in Richmond, Va.

"When Germany invaded Norway early last month and the Scandinavian area became the present locale of World War II, the source of supply of 70% of the cod liver oil used in the United States was immediately cut off and this nation faces a real shortage in this important medicinal product," Mr. Rodman said. "The hostilities came at a bad time for the cod liver oil industry as spring is the big cod fishing season and stocks of oil in this country are at their low point of the year following heavy winter sales when vitamin products are in the greatest demand.

"Norway's chief fishing ground for cod is around the Lofoten Islands near Narvik which has borne the brunt of intensive air, sea, and land fighting and the two principal refining centers are Bergen and Aalesund, both of which are or were in the hands of the German army and have, therefore, been the target for aerial warfare.

"It is doubtful, even if the war should end tomorrow, that fishing and refining activities could be sufficiently re-established during the current season to afford much relief from the shortage which is imminent and which will be felt even more next fall and winter when cod liver oil will again be in great demand as a vitamin tonic."

Cod liver oil is valuable for its content of vitamins A and D, the latter being the rickets-preventing vitamin. Both of these vitamins can be prepared from other sources and Mr. Rodman predicted that the cod liver oil shortage resulting from war will speed up research in the production of substitute fish liver oils and the manufacture of synthetic vitamins A and D. Iceland and Japan have been supplying 30% of U. S. cod liver oil imports in recent years.

The United States is in much better position with regard to medicinal chemicals than it was at the outbreak of the World War in 1914, but the market for botanical drugs has been disrupted for months by the present conflict. Germany, Hungary, Czechoslovakia, Jugoslavia, Poland and Russia supplied the bulk of these imported by the United States. The future supply depends largely on what Italy may do, Mr. Rodman said. If she joins Germany it will be "virtually impossible to obtain any botanical drugs from Europe."

These drugs include ergot, lavender flowers, orange peel, cascara, cantharides, camomile, malva flowers, buchu, henna, peppermint, gentian, arnica flowers, senega, anise, juniper berries, poppy, fennel, and arabic, asafetida, myrrh and benzoin gums.

Japan's recent suggestion of interest in the Dutch East Indies has worried the drug trade because the Indies are the source of the world's supply of cinchona bark from which quinine is made. Mr. Rodman pointed out that not only the world's quinine supply but through it world trade in other commodities might be upset if Japan should seize the Indies.

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Remedy for Ivy Poisoning

SUCCESSFUL remedy for ivy poisoning has been discovered in alkaline peroxide, Ole Gisvold, of the University of Minnesota College of Pharmacy, announced at the meeting.

Trial of the remedy with himself as guinea pig, after chemical studies suggested it would work, convinced Mr. Gisvold that the alkaline peroxide "proved quite effective in the treatment of ivy poisoning."

The alkali was sponged over the affected areas of the skin, and this was followed by sponging with peroxide. After a few minutes a weak solution of acetic acid was applied to neutralize the alkali. Two or three such treatments, once daily, Mr. Grisvold reported, were enough to destroy the "ivy phenol" that was not too deep seated and prevented it from spreading. Where the sores were quite deep, the treatment was somewhat painful, but only for a short time.

Back of the treatment were chemical studies of the reactions between the phenolic substance in poison ivy, which causes the damage to sensitive persons, and other chemicals such as lead acetate, ferric chloride, calamine and magnegsium oxide. Some of these chemicals precipitated the "ivy phenol" but the precipitates were themselves irritating.

"The only successful method of rendering the active phenols inactive," Mr. Gisvold stated, "involved their oxidation with alkaline peroxide."

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Druggist Aids Hosiery Mill

A SPECIAL ointment to protect the hands of hosiery mill workers without damaging the silk hose they work on was devised by a druggist called in consultation on this industrial health problem, Max N. Lemberger, Milwaukee, Wis., told the meeting as an example of the pharmacist's role as consultant.

Ordinary ointments or lotions protected the skin of the girls' hands from the strong alkaline solutions with which the raw silks were treated. The fats or oils of these ointments, however, damaged the silk, causing serious losses. The pharmacist, called in consultation by a skin specialist, made up a protective ointment of the vanishing cream type, containing no oil, but with enough acid to neutralize the strong alkaline base used in treating the silk.

Science News Letter, May 18, 1940

Jell for X-Ray Burns

HOPE that third degree X-ray burns may be cured by treatment with a jell from fresh *Aloe vera* leaves appears in studies announced by Tom D. Rowe, assistant professor of pharmacy in the Medical College of Virginia.

No proven curative treatment for these severe X-ray burns is known.

Successful use of the Aloe leaf in treatment of such burns in individual cases has been reported by physicians in recent years, but lack of experimental work under controlled conditions made it difficult to evaluate the treatment. Mr. Rowe, working with rats exposed to X-rays, found that the *Aloe vera* jell increased the rate of healing of the burns in 50% of those treated. His studies have not gone far enough yet, he said, for final conclusions, but he stated that "fresh *Aloe vera* jell shows some promise of being of value in the treatment of X-ray reactions."

Science News Letter, May 18, 1940

PHYSIOLOGY

Immature Rats Become Prolific Mothers

RATS hardly past the little girl stage of development in body size become prolific mothers, bearing offspring at twice the normal rate, under the stimulation of sex hormone treatment, Dr. H. H. Cole, of the University of California, reports. (*Science*, May 3.)

One young rat, bred three days after the sex hormone treatment, gave birth to a litter of 23 living offspring, which is more than twice the average number born under normal conditions. Breeding of such precociously matured rats has apparently no harmful effect. The youthful mother that gave birth to a litter of 23 while still immature in body size subsequently raised four other litters of 13, 10, 10 and 14 offspring respectively.

As many as 33 baby rats started to develop in one young rat mother following sex hormone treatment, but not all were born alive.

The treatment consisted of a single injection of eight rat units of mare gonadotropic hormone when the rats were between 30 and 33 days old.

Science News Letter, May 18, 1940

PHYSIOLOGY

Women More Efficient Metabolically Than Men

WOMEN appear to be more efficient than men in their adjustments to warm and cold environments so that in cold weather they are able to preserve their body heat and in warm weather can reduce the production of heat and therefore have to exert less effort in eliminating excess heat from the body. Such appear to be the indications of experiments reported by Drs. Eugene F. DuBois and James D. Hardy of Cornell University Medical College before the meeting of the National Academy of Sciences.

The two physiologists measured the rate at which heat is produced within the body and the rate at which heat is lost from the body surface of six young women. These data were compared with those obtained in similar tests with men. Men, it was found, produce internal heat at the same rate regardless of the temperature of the surrounding air. At low temperatures women produce heat at the same rate as men but in warmer environments their heat production decreased about 12%, thus making it unnecessary for them to sweat as much as the men.

"This is the first evidence that we have been able to find of the chemical adjustment to temperature and this response appears to be a response to heat and not cold," Dr. DuBois stated.

Women's skin temperatures change through a wider range than men's, it was found. Their average skin temperature in the cold environments was colder by one degree Centigrade than that for the men, and in the warm environments was two degrees Centigrade higher.

The above evidence indicates, Dr. DuBois stated, that women have more body insulation against cold than men and also have a spontaneous adjustment of their heat production in warm environments which makes it unnecessary for them to perspire as much as men.

Science News Letter, May 18, 1940

BIOLOGY

Organization to Promote Study of Species Origins

A NEW, informal organization, the Society for the Study of Speciation, is in process of formation, with Prof. Alfred E. Emerson of the University of Chicago serving as secretary, and an executive committee representing a number of other leading scientific institutions.

Object of the new association will be the study of the origins of species and races as a dynamic process. Scientists interested include anthropologists as well as zoologists, botanists and bacteriologists. Approaches to problems range from the study of specific and racial classification systems to life processes as manifested either in the field or in the physiological laboratory.

Science News Letter, May 18, 1940

PHYSIOLOGY

Early Nerve Responses Long Before Birth

NERVE responses of the reflex type begin at a very early age in human beings. The first to appear are those of the jaw regions, which can be detected as early as the eighth week of prenatal life, Prof. Ira D. Hogg of the University of Pittsburgh reported to the American Association of Anatomists.

These remain the only nerves capable of producing reflex reactions until the eleventh week, Prof. Hogg continued. From then on until the fourteenth week there is a gradual expansion of the reflexogenic areas until the whole body becomes sensitive and most of the recognized sensory reflexes are present.

Science News Letter, May 18, 1940

IN SCIENCE

PUBLIC HEALTH

Danger of Spring Epidemic From Poland Believed Past

DANGER of any serious epidemic disease breaking out in Poland and spreading with coming of spring is now believed past, according to James T. Nicholson, American Red Cross official, returned from six months' relief work in German-occupied Polish territory. Food is so scanty, however, that famine threatens this area in the interval before autumn harvest.

All winter, Mr. Nicholson states, immunization against typhoid and paratyphoid has been pushed in the area. To prevent typhus outbreaks, de-lousing and other sanitary precautions have been carried on. Disease incidence has been less than normal.

Science News Letter, May 18, 1940

DENTISTRY

Novocaine for Drilling May Lead to Injury

THE ALMOST universal custom of giving a patient with sensitive teeth a shot of procain or novocaine to prevent pain during drilling or other dental operation has its dangers, Dr. Charles F. Bodecker, Columbia University, declared at the Dental Centenary.

To guard against injury to the tooth, the dentist who gives an anesthetic before starting to drill must remember to work more slowly than he would if no anesthetic had been given. When pain is eliminated, Dr. Bodecker explained, "the tissue of the tooth no longer has the faculty of protesting against heat by fast operation and may be injured."

Anesthetics are often used unnecessarily by dentists, Dr. Bodecker charged. Some patients have more sensitive teeth than others. Unfortunately, the most sensitive are usually the ones needing most dental attention.

The sturdy man who feels no pain in the dentist's chair is wrong when he says it is all a matter of will power. He feels no pain because he has thoroughly calcified, non-sensitive teeth.

Science News Letter, May 18, 1940

NCE FIELDS

ARCHAEOLOGY

Unique Deer Horn Tool Solves Ancient Mystery

A UNIQUE deer horn tool unearthed near Kansas City clears up a mystery regarding America's prehistoric Mound Builders—how they made certain intricate designs on their clay bowls.

Tried out by Dr. Waldo R. Wedel of the Smithsonian Institution, the ancient tool enabled him to duplicate curving indented lines just as ancient Indians made them. The tool is tiny and resembles a notched wheel which can be rolled back and forth on soft clay. A good labor-saving device, it does easily a job that would be hard by a stamping process.

The discoverer, H. M. Trowbridge of Kansas City, suspected the significance of the tiny object and sent it to the Smithsonian scientists to study, Dr. Wedel said.

Mound Builders at their highest form of culture were the most advanced aborigines of central North America; and their decline and disappearance are problems of great interest to America's archaeologists.

Science News Letter, May 18, 1940

PSYCHOLOGY

Critical Persons Were Not Scared by Mars Broadcast

ABOUT a year and a half ago Orson Welles arranged for some Martians, brain children of H. G. Wells, to invade this earth via radio. Dr. Hadley Cantril has directed a factual and psychological study which resulted in "The Invasion from Mars" (Princeton University Press).

Through extensive interviews, he found that persons who were frightened by the broadcast were highly suggestible, they believed what they heard without making sufficient checks to prove to themselves that the broadcast was only a story. Those who were not frightened and those who believed the broadcast for only a short time were not suggestible. They were able to display what psychologists once called a "critical faculty."

The findings of "The Invasion from Mars" inquiry will interest all those who deal with the public, teachers who educate them, editors who inform them, public officials who are responsible for law and order. Therefore the generalizing conclusion in this quote and unquote from Dr. Hadley Cantril:

"Our study of the common man of our times has shown us that his ability to orient himself appropriately in critical situations will be increased if he can be taught to adopt an attitude of readiness to question the interpretations he hears. But when he achieves this healthy skepticism he must have sufficient and relevant knowledge to be able to evaluate different interpretations. If he is to judge these interpretations intelligently, his knowledge must be grounded in evidence or tested experience. If this skepticism and knowledge are to be spread more widely among common men, they must be provided extensive educational opportunities. And if this final critical ability is to be used more generally by common men, they must be less harassed by the emotional insecurities which stem from underprivileged environments."

Science News Letter, May 18, 1940

MILITARY SCIENCE

French in 1900 Had Tumble-Home Topsides

NO NEW thing upon the sea. Proposals to build our new battleships with "turtleback topsides" as protection against airbombs revive, in old-timers' memories, the profiles of certain French warships, vintage about 1900, that had what were then called "tumble-home topsides." Russia, then under strong French influence, had a few ships built the same way. They were reported to be ill ventilated and quite uncomfortable for their crews. But perhaps the ships of today, with three or four times their displacement and better ventilating systems, would offer better housing for seamen.

Science News Letter, May 18, 1940

PHOTOGRAPHY

Candid Cameras in Use Eighty Years Ago

CANDID and miniature cameras were in use some 80 years ago and detective cameras, some of them in such unusual forms as neckties and books were devised long before amateur photography rose to its present heights. They are shown in the Eastman Historical Photographic Collection now on display at the New York Museum of Science and Industry.

Science News Letter, May 18, 1940

ZOOLOGY

Two-Foot-Long Rat To Come from Liberia

IF YOUR property is by any chance pestered with rats, be thankful they didn't come from Liberia. In the canebrakes there, lives a rat species two feet in body length, specimens of which have been captured by Dr. Wm. M. Mann, now in the jungles of Liberia to obtain new beasts and birds for the National Zoological Park.

Other prizes captured by Dr. Mann include a pygmy squirrel, mouse-sized and equipped for gliding like our native flying squirrels; a potto, which is a big-eyed, nocturnal lemuroid, among the lowest of the ape-monkey tribe; and a number of duikers, which are tiny antelopes believed by the natives to possess four eyes apiece. The extra "eyes" are really slit-like glands near the nostrils.

In radioing his report of the new finds, Dr. Mann described also a great "beat" which resulted in the capture of a fine Liberian antelope. A large section of the jungle was surrounded by a cordon of 1200 natives, who advanced through the bush like a living net, driving whatever was enclosed toward the center. Among the animals thus captured, this rare antelope was the prize specimen.

Science News Letter, May 18, 1940

BIOLOGY

Try Colchicine on Animals Without Much Success

PLANT breeders have had such brilliant success recently in producing new genetic varieties with the drug, colchicine, that their colleagues who work with animals are anxious to go and do in like manner. However, they have their troubles because colchicine seems to be more highly toxic to animal tissues than it is to plants. Drs. H. A. Davenport and Frank B. Queen, Northwestern University, told the American Association of Anatomists of the difficulties that have attended their first attempts to modify the heredity of rats by the drug.

In concentrations sufficiently strong to have any effect, it had too much effect, causing local killing of the tissues around the areas where it had been injected. In lower concentrations, it did nothing to the rats' hereditary character.

Most hopeful, for possible future results, would seem to be injection of mild concentrations directly into the sex glands themselves. Experimental injections of this kind so far given have at least done the animals no demonstrable harm.

Science News Letter, May 18, 1940

PHYSICS

Films Improve Lenses

Thin Invisible Coatings Increase Efficiency of Glass By Reducing Light Reflected; Will Now Withstand Wear

See Front Cover

THROUGH a paradoxical treatment of glass—adding an invisible coating in order to let more light through—the cameras, windows, binoculars, movie projectors and other light-handling instruments so useful to us are having their efficiencies greatly increased.

Latest achievement in this suppression of optical reflections is the making of the thin films so rugged and permanent that they will stand scratching with a knife without harm. They can be soaked in sulfuric acid for a week without impairing their amazing optical properties.

A rush to put these amazing thin films to use is underway. Scientists are working hard to produce the best effects in the easiest ways. The properties of thin films, only a few molecules thick, only a fraction of the lengths of the light waves themselves, take on intensely practical meaning. A few months ago study of such coatings was considered merely "pure," unapplied research.

Like many developments this latest achievement of optics has a past. Nearly 50 years ago, in 1892, the British scientist, Dennis Taylor, found, surprisingly, that some of his camera lenses appeared to be faster (quicker in light-gathering power and hence needing a shorter exposure time) if they had a thin layer of tarnish on them. Ever since, science has realized that if such films could be made durable a new world of optical tricks and applications could be opened.

And now this 48-year-old dream of scientists has been realized.

PATON RANCH

Situated on a mountain stream in the foothills of the Big Horn Mountains. Here a limited number of guests are cordially welcomed.

It is a region of great geological and historical interest. Marine fossils, dinosaur bones and Indian implements are found nearby.

Guest cabins are comfortable and attractive. Food is good. The use of a saddle horse is included in the weekly rate.

Write for illustrated folder with map.

WILLIAM PATON

Shell Wyoming

Dr. C. Hawley Cartwright, scientist of Massachusetts Institute of Technology, has described and displayed pieces of glass covered with a circular thin film of magnesium fluoride. The edges of the glass, uncoated, reflected light in the ordinary, annoying way but the circular opening in the center, where the film was present, was at the same time clear and transparent. In some cases the film makes glass look as though it had a hole right through it.

New uses of a permanent film of the kind which Dr. Cartwright showed are immediately apparent and are, even now, being explored to the fullest.

One man certain to be interested is Dr. Julian S. Huxley of the Zoological Society of London who wrote to Science Service last year asking if the films were permanent enough to be used on the glass windows of London zoo cages. Foresighted Dr. Huxley well realized that with rugged, thin film coatings on the glass the visitor would have a much better view of the exhibit objects. Everyone probably has noted the annoying reflection on windows, show cases and glass-covered paintings.

Large commercial uses for transparent display windows, with amazing transparency, is foreseen. They would show the goods within as though they were in the open air, not behind glass.

Camera lenses that are "faster"—require less light to take comparable pictures—are already being perfected. On a small scale Dr. Cartwright is coating such lenses at M. I. T.

All manner of intricate optical equipment, with many different kinds of glass and air-to-glass surfaces, can be greatly improved by the use of the new rugged, thin films. The Navy, particularly, is interested in the application of thin films to periscopes which contain intricate "trains" of optical prisms and lenses.

As it is now, a periscope will bring about a total reduction in light that it will transmit by some 80%. Rays of light originally entering are partially reflected at each prism and lens surface. While the loss is small for any one reflection—about 5%—the cumulative effect of these 5%'s adds up into an amazing loss of light and a truly inefficient optical system. In practice this means that a submarine using a periscope at dawn or dusk becomes "sightless" long before it would otherwise need to if its periscope were more efficient in transmitting light.

The rugged, thin films now possible for glass surfaces are a splendid example of the often unforeseen ramifications of scientific research. They owe their origin—if one must pick a single factor—to man's desire to learn more about the universe and, in fact, grew out of research in which rugged, highly reflecting coatings of aluminum and chromium were deposited on telescope mirrors to make them reflect ultraviolet light better.

The fragile, temporary nature of silver coatings for telescope mirrors had long been realized. In the first half of the last decade, several groups of scientists were seeking to correct this trouble by perfecting techniques of evaporating onto glass, in a vacuum, a thin layer of aluminum or chromium metal.

At Cornell University, there was a group, consisting of S. L. Boothroyd, H. C. Ketcham, R. C. Williams and G. H.

DURABLE FILM

The shadow on Dr. C. Hawley Cartwright's chin shows how the durable thin film on the glass he is holding reflects less sunlight than does the plain glass around it.

Sabine. At California Institute of Technology were Drs. John Strong and C. Hawley Cartwright and at the University of California at Los Angeles was the group headed by Dr. H. W. Edwards.

With its close connection with nearby Mt. Wilson Observatory and the newly-created Mt. Palomar Observatory where the giant 200-inch diameter mirror telescope will some day be installed, the scientists at the California Institute of Technology vigorously pushed their researches, developing larger and larger vacuum chambers for the evaporation technique. It is virtually decided that the great 200-inch mirror of Mt. Palomar will receive an evaporated coating by Dr. Strong when it is finally ground to its needed accuracy.

With his background of evaporation methods learned at Caltech, Dr. Cartwright moved to Massachusetts Institute of Technology, across the continent, and with Dr. A. F. Turner has been adapting the method of evaporation of thin films to the old problem of cutting down light losses on lenses and optical parts by the application of a thin film whose thickness is only one-quarter that of a wavelength of visible light.

The recent step in this research has been to increase the hardness of the film by baking the films with heat. Dr. Turner has carried out many of the experiments which have perfected this method. A final advance has been the application of oil to the completed film. This not only increases the waterproofness of the film but also lubricates the film so that it is less likely to be scratched in service.

The astounding story of thin films and their ability to cut reflections on glass has a parallel chapter in the work of Dr. Irving Langmuir, Nobelist of the General Electric Research Laboratories and Dr. Katherine Blodgett on films of stearates, made by dipping glass into a bath on which floated the thin fil.ns which will be made only one molecule thick if necessary. Drs. Langmuir and Blodgett had for some years been studying these two-dimensional films and their properties. They then decided to build up a multiple film of these materials which would have multiple layers but whose total thickness would be only one quarter a wavelength of light.

They, too, obtained amazing pictures showing the decrease of reflection from glass treated in this manner and showed that the transmission was increased from 92% to over 99%.

It is most difficult to obtain rugged, permanent films from the stearate compounds, but research and added effort may some day produce the needed permanence which will make these films, too, widely useful.

The evaporated films of the fluoride compounds which Dr. Cartwright uses, in contrast, can now be made so tough that one may scratch the films with a penknife and leave the film unharmed. The potential uses of these films are many.

Dr. John Strong on the West Coast, it is understood, is working with the motion picture studios coating their camera lenses. Dr. Cartwright, likewise, has been working with the motion picture industry which is keenly interested for color photography.

Color photographs require longer exposures to get pictures, as any amateur photographer knows who has tried to take such pictures for home movies. Any increase in camera "speed" due to the coating represents a real, tangible gain for the professional cameraman who can "shoot" scenes in color under conditions of lighting which they could not tackle before.

Television, too, is a very new field which would be extremely interested in getting "faster" lenses for the television cameras, new eyes for broadcasting.

Another new, suggested usefulness of coated "non-reflecting" glass, which should interest women particularly, is for eye glasses. While not available commercially such glasses are being studied experimentally and they have much less reflection. It is this reflection which makes one's glasses visible to another person.

Many men and women wear glasses but dislike to do so because the glasses betray their appearance. Such people will be keenly interested in this development when it is perfected. The goal—perhaps a long way from realization—would be to have "invisible glasses" which would be as unseeable, without frames, as anything which could be devised.

A major task which Dr. Cartwright has set for himself is to perfect his thin film, evaporation method so that it can be carried out in air and not, as now, in a vacuum.

If this goal can be realized it will mean the day when whole store windows and other large glass surfaces can be coated with thin films and bring greatly increased realism to the products displayed behind them.

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- **ANATOMY**
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MEDICINE

Cirrhosis of the Liver Produced by Vitamin Lack

Rabbits Deprived of Vitamin Found in Yeast Develop Cirrhosis Like That Affecting Humans

CIRRHOSIS of the liver can be produced by a diet lacking in a vitamin found in yeast, Dr. Arnold R. Rich and Dr. John D. Hamilton, Johns Hopkins Medical School, reported to the Association of American Physicians in Atlantic City.

Rabbits kept on such a diet developed liver cirrhosis of a type resembling Laennec's cirrhosis in man, the Hopkins scientists reported. This is the first time, so far as is known, that anything like this type of cirrhosis has been produced experimentally by an inadequate diet.

Whether or not a similar dietary deficiency causes cirrhosis of the liver in man cannot be deduced from the rabbit studies, Drs. Rich and Hamilton pointed out, because not all animal species react in the same way to a given vitamin deficiency.

Cirrhosis of the liver, however, occurs frequently in chronic alcoholics many of whom are known to eat an inadequate diet, particularly with respect to the vitamins occurring in yeast. Vitamin treatment of patients with alcoholic cirrhosis has previously been reported to improve not only the vitamin deficiency symptoms but also liver function. These observations seem to strengthen the link between vitamin deficiency and liver cirrhosis shown by the rabbit experiments.

The cirrhosis in the rabbits was not due to lack of vitamins B_1, B_2, B_6 or nicotinic acid, but to some other factor in yeast. It may have been choline, lack of which in the diet favors fatty livers in animals, though occurrence of cirrhosis in such livers has not previously been reported.

These investigations are reported in detail in the *Bulletin of the Johns Hopkins Hospital*, (March).

Science News Letter, May 18, 1940

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DENTISTRY

Acids Are Most Dangerous Solvents of Tooth Material

CONTRARY to a widespread belief, candy and sugar do not directly decalcify and thus cause decay of the teeth, but pickles and certain salad dressings may do so, according to Drs. John W. Trask, Edwin E. Ziegler, and Edward C. Maloof of the U. S. Public Health Service. That does not mean that sugars and starches are harmless, however, for they contribute to tooth decay by producing lactic acid in the mouth through fermentation, while various acid solutions act directly as solvents.

Although other factors are also involved in tooth decay, such as digestion, assimilation, infections, heredity, and endocrine influences, these experiments suggest that certain commonly used acid foods may play an important role, and they emphasize the necessity of proper oral hygiene in order to reduce the exposure of the enamel to substances of high solvent action.

The purpose of the experiments conducted by these investigators was to determine the relative solvent action, on the teeth, of solutions of various substances. They did this in a practical manner by subjecting small pieces of noncarious teeth to different solutions, which were allowed to flow slowly about the pieces of tooth, and they believe that theirs is the first attempt to evaluate the relative solvent power of various substances quantitatively.

The substances used included acids, alkalies, salts, waters, and carbohydrates. The acids—citric, phosphoric, lactic, acetic, benzoic, tartaric, oxalic, and carbonic, in the order named—were found to have the highest solvent action, with citric acid dissolving 78.8 per cent. of the tooth in 5 days. The alkalies showed no significant solvent action on the tooth material, nor did tap water or distilled water, although the latter dissolved more of the tooth substance than did plain tap water. The sugars preserved with thymol (1:1000) showed practically no solvent action, while those without the thymol preservative produced some fungus and bacterial growth, with resulting increase in solvent power. Common salt solution without thymol showed greater solvent action than most sugars with or without thymol, but with thymol its solvent ability was greatly reduced.

Science News Letter, May 18, 1940

● RADIO

Prof. W. L. Warner, anthropologist and sociologist of the University of Chicago will describe living in "Yankee City—Deep South" as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, May 23, 4:15 p.m., EDST, 3:15 EST, 2:15 CST, 1:15 MST, 12:15 PST.

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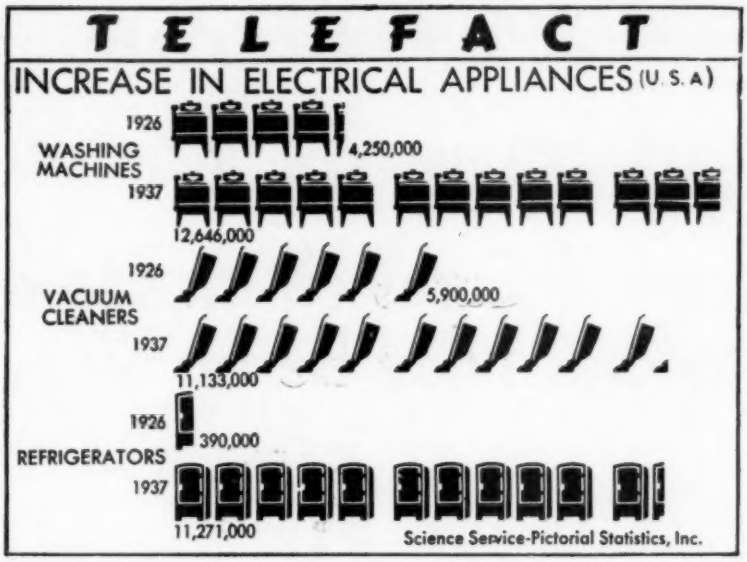

PSYCHOLOGY

Engaged Couples Found To Be Like Each Other

Study of 300 Engaged Couples Reveals That on Not a Single One of 36 Traits Were They Opposites

BOY loves Girl and Girl loves Boy, not because "opposites attract," but because they are closely alike in conventionality, religious feeling, dependability, breadth of interest and initiative.

Studies of 300 engaged couples, "most of whom have since married" told Dr. E. Lowell Kelly of Purdue University this, through undergoing a battery of psychological tests and allowing their friends to be questioned. Dr. Kelly told the Midwestern Psychological Association meeting in Chicago.

In not one of the 36 personality traits rated in Dr. Kelly's psychological study were the couples "opposite."

Financial support for the study was provided by the Committee for Research in Problems of Sex of the National Research Council.

Science News Letter, May 18, 1940

DON'T BE SEASICK!
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Partially Deaf Aided

A PARTIALLY deaf person can understand speech much better with what hearing he has left if he has special training, Dr. Louis D. Goodfellow, of Northwestern University, told the meeting.

With some individuals, the loss of hearing is for certain pitches of tone only. These can have their defect corrected with amplifier compensated so as to exaggerate the pitches in which they are weak. As training proceeds, this compensation can be gradually decreased until the patient has adjusted himself to his own distortion of hearing.

Subtle, incidental cues such as noises and gross patterns can be used by the individual in "catching" what is said if he is trained to take notice of them, said Dr. Goodfellow, who is director of research for the American Institute for Deaf-Blind. The attitude of the individual toward his deafness is another important factor which, he feels, can be modified by training to enable him to make the fullest possible use of his residual hearing.

Science News Letter, May 18, 1940

Dull Students Fare Poorly

DULL boys in school are likely to have a hard time getting and keeping jobs later in life, it appears from a follow-up of such persons reported by Dr. Warren R. Baller, of the University of Nebraska.

Tracing the careers of 307 individuals, who when in school were judged to have below-average intelligence, Dr. Baller found that they fared less well than have a similar group in age, nationality and sex, but with average intelligence.

These "dull" but normal persons were no better off in many respects, than another group who were actually deficient, Dr. Baller said.

Science News Letter, May 18, 1940

Democracy Favors Growth

A "DEMOCRATIC" home, free of dictatorship, allows the children to develop as they should socially, Drs. Mary Frances Hartson and Horace Champney of the Samuel S. Fels Research Institute, Antioch College, reported as the result of a study of 40 children and their parents.

A home in which children are free is conducive to social maturity, they found, whether this freedom is the result of conscious effort on the part of the parents to withhold unnecessary restrictions, advice and assistance, or whether it is due to the parents' being busy with other matters.

Science News Letter, May 18, 1940

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BOTANY

NATURE RAMBLINGS
by Frank Thone

Eagle or Dove?

BOTANISTS' Latin and common English disagree over the columbine. To be sure, the common English name of this beautiful flower is not English. It comes from the Latin also, from *columba,* the Romans' word for dove. There is supposed to be something suggestive, in the appearance of the clustered tops of the conical petals, either of five doves in a nest or of a similar group clustered around a dish. The latter was a favorite motif in later Roman art.

The Latin name for the columbine is *Aquilegia.* It is commonly stated that this is derived from *aquila* (eagle), being a supposed reference to the five "claws" or spurs in which the petals end. To be sure, the eagle, like most birds, has but four claws—but what's an extra claw to a neat floral fancy?

However, botanists are not all agreed that the columbine borrowed its name from the eagle. In Bailey's Cyclopedia of Horticulture the flat declaration is made, that the name is "from *aquilegus,* water-drawer, not from *aquila,* eagle." Gray's Manual, the botanists' old standby, is more non-committal, stating merely, "Name of doubtful origin."

There are about 50 species of columbine, well distributed around the Northern Hemisphere. The United States has its fair share of exceptionally beautiful ones. Throughout the entire northeastern quarter of the country there is but one species, the sturdy but graceful orange-red Canada columbine. In the West, however, the species are more numerous and varied. Notable are the Colorado columbine, blue, with amazingly long spurs, and the smaller, clear-yellow species found farther north, in and around Yellowstone National Park.

The short-spurred blue, white and red varieties grown in gardens are all color phases of common European columbine. Until a generation or so ago, this exotic was the only columbine cultivated in this country. Now, however, several of the fine native species have found their way into popular acceptance.

One strong point in favor of columbines, particularly of the native American species, is their ability to thrive in partial shade, so that they make highly desirable flowers for interplanting among shrubbery. They like a rich, loose soil, well moistened but well aerated.

Science News Letter, May 18, 1940

MEDICINE

Chemical Cures With Gold Remedies May Be on Way

GOLD is joining the ranks of arsenic and sulfur as chemicals that cure.

A single injection of a gold compound, called gold sodium thiomalate or myochrysine, will protect mice against rapidly fatal doses of the germ, Streptobacillus moniliformis, when two other chemical remedies, the syphilis cure, neoarsphenamine, and the pneumonia remedy, sulfapyridine, are ineffective, Dr. Fordyce R. Heilman, of the Mayo Clinic, reports. (*Science,* April 12) This germ has been incriminated as the cause of some cases of rat bite fever.

The fatal ailment for which the gold compound was found so effective was, to be sure, an experimental disease in mice. Sulfanilamide, however, first proved its worth in protecting mice against germ infection.

The same gold compound that cured mice of the experimental streptobacillus infection has been used in treating human arthritis patients. A favorable response in 94 out of 100 patients has been reported by one group of physicians using this treatment and other doctors, especially in England and on the Continent, have been well impressed with results of gold treatment of arthritis.

Serious drawback to this treatment is the danger of liver and kidney damage and blood and skin diseases, some of which end fatally. The case at present for and against gold compounds in treating arthritis is summed up by Drs. H. M. Margolis and V. W. Eisenstein, of Pittsburgh, in a report to the American Medical Association: (*Journal,* April 13).

"Gold salts offer a promising, but at present dangerous, adjunct to the armamentarium of the practitioner."

With the present tremendous interest in chemical curing of disease, and with scientists in a number of institutions already working on gold remedies, it is reasonable to suppose that a way may be found for safe treatment of some ailments with remedies of gold, as well as with remedies from sulfur and arsenic.

Science News Letter, May 18, 1940

The advertisement on the opposite page was published in the January 27 edition of EDITOR & PUBLISHER, the weekly magazine of the journalistic profession.

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New York Times

From the famous Topics of the Times column, July 17, 1939

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•First Glances at New Books

ENGINEERING

THE ST. LAWRENCE SEAWAY—F. N. Menefee—*Edwards Brothers, Inc.*, 325 p., $2.50. A roundup in one volume of the complete story of man's attempt to link the Great Lakes with the Atlantic Ocean in a series of large canals that will take ocean-going vessels. The author gives you the history of the project, the climate and geology of the region, the Illinois waterway and its relation to the problem, the diplomatic correspondence and treaties, engineering problems and the economics of the proposed St. Lawrence waterway.

Science News Letter, May 18, 1940

PSYCHOLOGY

THE INVASION FROM MARS — Hadley Cantril, Hazel Gaudet and Herta Herzog—*Princeton Univ. Press,* 228 p., $2.50. See p. 313.

Science News Letter, May 18, 1940

MATHEMATICS

REVIEWS AND EXAMINATIONS IN ALGEBRA—Oswald Tower and Winfield M. Sides—*Heath,* 175 p. $1.20. Review algebra as prepared by teachers at Phillips Academy, Andover, Mass.

Science News Letter, May 18, 1940

CHEMISTRY

SEMIMICRO QUALITATIVE ANALYSIS — William Lloyd Evans, Alfred Benjamin Garrett and Laurence Larkin Quill—*Ginn,* 245 p., $2. An excellent laboratory textbook for use with a college course on qualitative analysis, following the newer trends of using semimicro methods.

Science News Letter, May 18, 1940

AERONAUTICS

THE STORY OF FLYING — Archibald Black—*Whittlesey House,* 267 p., $2.75. Here is a moving, stirring story of aviation from its early beginning down to its glorious present. Nearly everything that has happened in aviation is told in this book, and told well.

Science News Letter, May 18, 1940

RADIO

RADIO'S MASTER ENCYCLOPEDIA, Official Equipment Manual of the Radio Industry — *United Catalog Publishers,* $2.50. What to buy and where to buy it in the field of radio. Classified and indexed.

Science News Letter, May 18, 1940

TECHNOLOGY—ECONOMICS

TECHNOLOGY AND LABOR, A Study of the Human Problems of Labor Saving —Elliott Dunlap Smith and Richmond Carter Nyman—*Yale Univ. Press,* 222 p., $2.50. From Yale University, investigators visited eighteen cotton mills at the time the "stretch-out" system was being installed, to study the human problems involved in such a technological change. Their report, admittedly subjective and lacking the statistical approach, should interest employers and workers alike as well as students of social questions.

Science News Letter, May 18, 1940

PSYCHOLOGY

MASTERING YOUR NERVES—Peter Fletcher—*Dutton,* 241 p., $1.50. Intended as an aid to medical and clerical workers in dealing with certain ailing persons this little book is not, the author states, a psychological textbook and he makes "no apology for the fact that some of my explanations of mental phenomena are not to be found in the textbooks."

Science News Letter, May 18, 1940

PSYCHOLOGY

MINOR MENTAL MALADJUSTMENTS IN NORMAL PEOPLE—J. E. Wallace Wallin —*Duke Univ. Press,* 298 p., $3. Based on original autobiographies of normal people who were just "a little bit odd" about something, this case book will be useful to those interested in promoting mental hygiene.

Science News Letter, May 18, 1940

SOCIOLOGY

OLD-AGE SECURITY, Social and Financial Trends—Margaret Grant — *Social Science Research Council,* 261 p., $2.50. An analysis of the systems for old-age security as existing in foreign countries, with the purpose of throwing light on parallel problems in the United States.

Science News Letter, May 18, 1940

GENETICS

PEDIGREES AND CHECKERBOARDS — E. Fletcher Barrows — *Edwards Brothers,* 231 p., $1.50. Problems in genetics, simply but practically presented as diagrammatic pedigree charts, for all sorts of organisms from fruit-flies and peas to cats and cows. Should have high value as a teaching device.

Science News Letter, May 18, 1940

ANTHROPOLOGY

THE PUYALLUP-NISQUALLY — Marian W. Smith—*Columbia Univ. Press,* 336 p., $5. An anthropological study of an Indian culture of the Puget Sound region, made by tapping the memory of every available Indian from 68 years old to 80.

Science News Letter, May 18, 1940

ASTRONOMY

THE MASSES OF THE STARS, with a General Catalogue of Dynamical Parallaxes—Henry Norris Russell and Charlotte E. Moore—*Univ. of Chicago Press,* 236 p., $3.50. This excellent monograph for the expert grew from a lecture on the masses of stars which Prof. Russell presented at the Harvard Tercentenary celebration.

Science News Letter, May 18, 1940

HORTICULTURE

PLANTING DESIGN—Florence Bell Robinson—*Whittlesey House,* 215 p., $2.75. Many of us who make gardens have the urge-to-plant so strongly that we 'just plant," regardless. But if we restrain our impatience a little, while we figure out what to plant and where to plant it, our efforts will bring much richer rewards. This book tells how.

Science News Letter, May 18, 1940

GEOGRAPHY

THE PHYSIOGRAPHIC PROVINCES OF NORTH AMERICA—Wallace W. Atwood —*Ginn,* 535 p., $4.80. The great regions of this continent, seen in a masterly sweep and described so lucidly and vigorously that the reader sees through the eyes of the author. Geologists and geographers will understand their problems better for having gained an understanding of the underlying principles here outlined.

Science News Letter, May 18, 1940

BOTANY

ADAPTATION AND ORIGIN IN THE PLANT WORLD, I. Factors and Functions in Coastal Dunes—Emmet V. Martin and Frederic E. Clements—*Carnegie Inst. of Washington,* 107 p., 5 pl., 50c. Results of autecological studies on California dunes, that have high potential value for the light they throw on other botanical disciplines, such as taxonomy, morphology and phylogeny.

Science News Letter, May 18, 1940

ANTHROPOLOGY

ACCULTURATION IN SEVEN AMERICAN INDIAN TRIBES—Ralph Linton, ed.—*Appleton-Century,* 526 p., $4. Studies of the effects of white civilization on selected Indian tribes, and an analysis of the needs of such groups and ways in which they strive to fill these needs while substituting new culture elements for old. Seven authors contribute the tribal studies, and Prof. Linton adds discussion and conclusions.

Science News Letter, May 18, 1940